

**APPARATUS, METHOD AND SYSTEM FOR
CORRELATED NOISE REDUCTION IN A
TRELLIS CODED ENVIRONMENT**

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Abstract of the Disclosure

An apparatus, method and system are provided for correlated noise
10 reduction, in a trellis decoding environment, such as second generation HDSL, in which
crosstalk impairments may be significant. The preferred embodiments provide
equalization and correlated noise reduction, utilizing a training period to generate
corresponding coefficients, and utilizing two different training error signals. In addition,
the apparatus method and system also provide continued and adaptive correlated noise
15 reduction during data transmission, utilizing two additional error signals, a trellis error
signal and a tentative error signal. The trellis error signal is a decision error of a selected
previous state of a selected trellis path, in which the selected trellis path has a smallest
cumulative error of a plurality of trellis paths, and the selected previous state is preferably
the immediately previous state. The tentative error signal is formed as a difference
20 between a delayed, tentative symbol decision and a delayed received data signal
subsequent to equalization, in which the delay is preferably one symbol time. The
various embodiments may be utilized with trellis encoding, with or without data
precoding.

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